

REMARKS

This is in response to the Office Action dated December 14, 2007. In the Office Action, all pending claims 1-18, 23-41, 46-64, 69-77 and 82-111 were rejected. With this Amendment, claim 1 has been amended and the remaining claims are unchanged in the application. Applicant respectfully requests reconsideration and allowance of all pending claims.

Support for the amendment to claim 1 can be found, for example, in FIG. 1 of the application which shows voltage multiplier circuit (DC-DC converter circuit) 16 directly electrically coupled to terminals of storage battery 12 without any intervening electrical measurement components between the DC-DC converter circuit and the storage battery.

On page 2 of the Office Action, claim 1 was rejected under 35 U.S.C. §102(b) as being as being anticipated by Dias et al., U.S. Patent No. 5,694,024.

Claim 1, which is directed to an apparatus for counteracting self discharge in a storage battery, includes “a charge supply battery configured to provide a supply voltage; and a DC-DC converter circuit having an input electrically coupled to the charge supply battery and an output configured to directly electrically couple to terminals of the storage battery without any intervening electrical measurement components between the DC-DC converter circuit and the storage battery; wherein the charge supply battery is of a different type and construction than the storage battery.” (Emphasis Added.)

The Office Action suggests that FIG. 2 of Dias and its corresponding description show all the elements of claim 1. However, Dias discloses a complex battery charger (shown in FIG. 2 of Dias), which, in addition to a controller 210 having a voltage regulator and charging timer, includes a current sense component 204 and a voltage sense component 205 connected between component 202 (which the Office Action indicates is a DC-DC converter circuit) and the battery to be charged 250. The inclusion of components 204 and 205 in the charger of Dias eliminates any possibility of direct electric coupling of component 202 to the battery to be charged 250.

As noted above, claim 1 requires “a charge supply battery” and also requires that the charge supply battery be of “a different type and construction than the storage battery.” The Office Action indicates that item 25V shown in FIG. 2 of Dias is a charge supply battery of the type

required by claim 1. Column 3, lines 12-15, of Dias, which briefly describe the 25 volt power supply, are as follows:

Controller 210 has an internal voltage regulator, so a 25 volt power supply may be used as illustrated to provide charging of multicell battery packs.

The above language shows that item 25V in FIG. 2 is not a battery. Thus, Dias does not show “a charge supply battery” or a charge supply battery being of “a different type and construction than the storage battery.”

For the above reasons, Dias does not show all the elements of claim 1. Thus, Dias does not anticipate claim 1.

On page 3 of the Office Action, claims 2-18 and 82-94 were rejected under 35 U.S.C. §103(a) as being unpatentable over Dias, in combination with a paper published by Electronix Express (a non patent publication, November 10, 1998).

“To support the conclusion that the claimed invention is directed to obvious subject matter, either the references must expressly or impliedly suggest the claimed invention or the examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references.” Ex parte Clapp, 227 USPQ 972, 973 (Bd. Pat. App. & Inter. 1985).

In addition to not showing all the above-noted claim elements, Dias does not expressly or impliedly suggest all the elements of the claimed invention. Further, the charging system of Dias is designed to utilize feedback during charging in the form of current and voltage measurements, and also to utilize embedded information in the battery being charged. Column 2, lines 6-12, which are included below, describe the adaptive nature of the charging device of Dias.

The present invention provides battery charging with charging parameter values selected by communication with imbedded information in a battery pack and then adjusted during charging. This permits adaptation to various battery chemistries and capacities, and, in particular, allows for approximately constant current charging at various current levels and for trickle charging.

Based on the foregoing, Applicant respectfully asserts that the Examiner has not provided a convincing line of reasoning as to why an artisan would have found the claimed apparatus for counteracting self discharge in a storage battery obvious in light of the complex feedback-based battery charger of Dias.

The Electronix Express published paper does not overcome the deficiencies of Dias. Thus, claims 2-18 and 82-94 are non-obvious and allowable over the combination of Dias and the Electronix Express published paper.

On page 4 of the Office Action, claims 23-41 and 95-100 were rejected under 35 U.S.C. §103(a) as being unpatentable over Tomantschger, U.S. Patent No. 5,637,978 in combination with a paper published by Electronix Express (a non patent publication, November 10, 1998) and Bertness, U.S. Patent No. 6,249,124.

Tomantschger discloses a booster battery assembly having a booster battery that is not protected from self-discharge by a charge supply battery and a DC-DC converter. The Electronix Express published paper only describes, in general, the design and operation of DC-DC converters, and Bertness relates to an electronic battery tester with an internal battery. None of these references taken alone or in combination teach or suggest a DC-DC converter circuit having an input electrically coupled to a charge supply battery and an output electrically coupled to a storage battery (or booster battery), which is of a different type and construction than the charge supply battery. Further, the Examiner has not presented a convincing line of reasoning as to why an artisan would have found the claimed invention to have been obvious in light of the teachings of the references. Thus, claims 23-41 and 95-100 are non-obvious and allowable over the cited art.

On page 5 of the Office Action, method claims 46-64, 69-77 and 101-111 were rejected for the same reasons in the earlier sections in connection with the apparatus claims.

For reasons provided above, Applicant believes that method claims 46-64, 69-77 and 101-111 are non-obvious and allowable over the cited art. Further, although some method claims differ substantially from the apparatus claims, the Office Action has not addressed these differences in the rejection. For example, independent method claims 46 includes “providing a charging voltage to the storage battery as a function of the supply voltage, with the charging voltage having a

magnitude greater than a magnitude of supply voltage.” Although a similar element does not appear in the independent apparatus claims, the Office Action does not address this element. In any event, Dias teaches or suggests nothing about this element. The remaining references do not compensate for the deficiencies of Dias.

In view of the foregoing, Applicant respectfully requests reconsideration and allowance of all pending claims 1-18, 23-41, 46-64, 69-77 and 82-111. Favorable action upon all claims is solicited.

The Director is authorized to charge any fee deficiency required by this paper or credit any overpayment to Deposit Account No. 23-1123.

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